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EXAMINER
WONG, ALLEN C

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2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/930,672	SCHAAR ET AL.
	Examiner	Art Unit
	Allen Wong	2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 12 September 2005.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-36 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-36 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/12/05 has been entered.

Response to Arguments

1. Applicant's arguments with respect to claims 1, 7, 13, 19, 25 and 31 have been read and considered but are moot in view of the new ground(s) of rejection.

Regarding pages 9-10 of applicant's remarks about the provisional rejection of claims 1, 3, 7, 13, 15, 19, 25, 27 and 31, applicant disagrees with the provisional rejection of claims 1, 3, 7, 13, 15, 19, 25, 27 and 31. The examiner respectfully disagrees. The provisional obviousness double patenting rejection is valid because the claim language of claim 1 of the present invention, "encoding... video to generate extended base layer reference frames... generating frame residuals...", and the claim language of claim 3 of the present invention, "coding the frame residuals with a fine granular scalable codec", combined together to form the similar language of claim 1 of copending Application No. 09/793,035, "coding video data to produce base layer frames... generating residual images... coding the residual images with a fine granular scalability... " The reason for why a person of ordinary skill in the art would conclude

that the invention defined in claims 1/3 of the present invention is an obvious variation of the invention defined in claim 1 of the copending Application No. 09/793,035 is by simply tweaking the wording of the claims 1/3 of the present invention to mirror the claim language of claim 1 of the copending Application No. 09/793,035 as any one of ordinary skill in the art can clearly acknowledge. Wu (US 6,614,936) can be combined to teach that there can be at least a fractional bit plane, as noted in Wu's fig.9. So, the applicant's copending application can be combined with Wu's teachings for achieving the coding and decoding of the base layer reference frame and at least fractional bitplane of an associated enhancement layer reference frame. Therefore, it would have been obvious to one of ordinary skill in the art to combine Wu's teaching of progressive fine-granularity scalable encoding scheme with De Bonet's video encoding system for yield high encoding efficiency and good error recovery, especially during transmission over the Internet and wireless channels (Wu's col.6, ln.66 to col.7, ln.2).

Similarly, the combination of claims 25 and 27 of the present invention is equivalent to claim 9 of copending Application No. 09/793,035 because the claim language of claims 25 and 27 of the present invention is similar to the claim language of claim 9 of copending Application No. 09/793,035. Also, the combination of claims 13 and 15 of the present invention is equivalent to claim 11 of copending Application No. 09/793,035 because the claim language of claims 13 and 15 of the present invention is similar to the claim language of claim 11 of copending Application No. 09/793,035. And claim language of claim 7 of the present invention is almost identical to claim language of claim 5 of copending Application No. 09/793,035. The claim language of claim 19 of

the present invention is almost identical to the claim language of claim 12 of copending Application No. 09/793,035, and the claim language of claim 31 of the present invention is almost identical to the claim language of claim 10 of copending Application No. 09/793,035.

Thus, a provisional obviousness-type double patenting rejection is done because the conflicting claims have not in fact been patented.

Claims 1, 2, 4-14, 16-26 and 28-36 are now rejected under De Bonet in view of Wu. Peruse the rejection below.

Regarding page 11 of applicant's remarks about claims 3, 15 and 27, applicant argues that De Bonet fails to teach the reference frame as previously stated for independent claims 1, 13 and 25. The examiner respectfully disagrees. As stated in the rejection below, De Bonet teach the generation of extended base layer reference frames which each includes a base layer reference frame and at least a portion of an associated enhancement layer reference frame. De Bonet does not specifically disclose the step of coding the frame residuals with a fine granular scalable codec to generate fine granular scalable enhancement layer frames. However, Wu teaches the use of progressive fine granular scalable codec to generate fine granular scalable enhancement layer frames (col.5, ln.23-33). Therefore, it would have been obvious to one of ordinary skill in the art to combine Wu's teaching of progressive fine-granularity scalable encoding scheme with De Bonet's video encoding system for yield high encoding efficiency and good error recovery, especially during transmission over the Internet and wireless channels, as disclosed in Wu's col.6, ln.66 to col.7, ln.2.

Thus, the rejection of claims 1-36 is maintained.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1, 3, 7, 13, 15, 19, 25, 27 and 31 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 5 and 9-12 of copending Application No. 09/793,035. Although the conflicting claims are not identical, they are not patentably distinct from each other because the combination of claims 1 and 3 of the present invention is equivalent to claim 1 of copending Application No. 09/793,035, where Wu (US 6,614,936) can be combined to teach that there can be at least a fractional bit plane, as noted in Wu's fig.9. Similarly, the combination of claims 25 and 27 of the present invention is equivalent to claim 9 of copending Application No. 09/793,035. Also, the combination of claims 13 and 15 of the present invention is equivalent to claim 11 of copending Application No. 09/793,035. And claim 7 of the present invention is almost identical to claim 5 of copending Application No. 09/793,035, claim 19 of the present invention is

almost identical to claim 12 of copending Application No. 09/793,035, and claim 31 of the present invention is almost identical to claim 10 of copending Application No. 09/793,035.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Bonet (6,510,177) in view of Wu (6,614,936).

Regarding claim 1, De Bonet discloses a method of coding video (fig.2, element 220), comprising the steps of:

encoding an uncoded video to generate extended base layer reference frames (fig.2, element 220 is the layered video encoder that utilizes a base layer module 224 and an enhancement layer module 228 to generate base layer reference frames), each of the extended base layer reference frames including a base layer reference frame and at least a portion of an associated enhancement layer reference frame (in fig.9, De Bonet discloses the "extended" or enhanced base layer reference frames include base layer frames, as inputted in element 905, and at least a portion of an associated enhancement layer reference frame, as inputted in element 925 where high-resolution

motion vectors are the "portion of an associated enhancement layer reference frame", and also, in col.13, ln.48-50, note base layer and high resolution motion vectors are used for prediction where the reference frames, I and P frames, are used to obtain B-frames, thus prediction requires reference frames); and

generating frame residuals from the uncoded video and the extended base layer reference frames (fig.6, element 655 generates frame residuals from uncoded video and fig.9, element 945 is where the frame residuals are generated from the extended base layer reference frames).

De Bonet does not specifically disclose the fractional bit plane of an associated enhancement layer reference frame. However, Wu teaches the use of the fractional bit plane of an associated enhancement layer reference frame (fig.9, Wu discloses the use of encoding at least the fractional bit plane of an associated enhancement layer reference frame in elements 226(1) to 226(n)). Therefore, it would have been obvious to one of ordinary skill in the art to combine Wu's teaching of progressive fine-granularity scalable encoding scheme with De Bonet's video encoding system for yield high encoding efficiency and good error recovery, especially during transmission over the Internet and wireless channels (Wu col.6, ln.66 to col.7, ln.2).

Regarding claim 2, De Bonet discloses a method of coding video according to claim 1, further comprising the step of coding the frame residuals with a scalable codec selected from the group consisting of DCT based codecs or wavelet based codecs to generate enhancement layer frames (col.13, ln.30-37; DCT based scalable coding or wavelet coding is applied to the frame residuals to generate enhancement layer

frames, as seen in fig.9, the frame residuals are coded in element 955, and then, in element 960, enhancement layer frames are generated).

Regarding claims 3, 15 and 27, De Bonet discloses further the step of coding the frame residuals (fig.6, element 660). De Bonet does not specifically disclose the step of coding the frame residuals with a fine granular scalable codec to generate fine granular scalable enhancement layer frames. However, Wu teaches the use of progressive fine granular scalable codec to generate fine granular scalable enhancement layer frames (col.5, ln.23-33). Therefore, it would have been obvious to one of ordinary skill in the art to combine Wu's teaching of progressive fine-granularity scalable encoding scheme with De Bonet's video encoding system for yield high encoding efficiency and good error recovery, especially during transmission over the Internet and wireless channels (Wu col.6, ln.66 to col.7, ln.2).

Regarding claim 4, De Bonet discloses a method of coding video according to claim 1, wherein the frame residuals include B frame residuals (col.12, ln.41-44 and fig.6, element 655 calculates the B frame residuals).

Regarding claim 5, De Bonet discloses a method of coding video according to claim 4, wherein the frame residual further include P frame residuals (col.12, ln.41-44 and fig.6, element 655 calculates the P frame residuals).

Regarding claim 6, De Bonet discloses a method of coding video according to claim 1, wherein the frame residual include P frame residuals (col.12, ln.41-44 and fig.6, element 655 calculates the P frame residuals).

Regarding claim 7, De Bonet discloses a method of decoding a compressed video having a base layer stream and an enhancement layer stream (fig.2, element 260 has a base layer decoder module 270 and an enhancement layer decoder module 280), the method comprising the steps of:

decoding the base layer and enhancement layer streams to generate extended base layer reference frames (fig.2, element 260 decodes the base layer, via element 270, and the enhancement layer, via element 280, to generate "extended" or enhanced base layer reference frames for viewing an enhanced video output), each of the extended base layer reference frames including a base layer reference frame and at least a portion of an associated enhancement layer reference frame (in fig.11A, module 1020, at element 1124, the base layer reference frame data is received, and at element 1133, the "at least a portion of an associated enhancement layer reference frame" or residual P-frames are received, as disclosed in col.17, lines 1-8, and then the base layer reference frame data and the "at least a portion of an associated enhancement layer reference frame" are summed together at element 1142 to form high resolution P-frames); and

predicting frame residuals from the extended base layer reference frames (col.17, ln.1-14, in fig.11A, frame residuals are decoded and predicted from the "extended" or enhanced base layer reference frames by utilization and application of the enhancement of the upsampled motion vectors using additional enhancement layer motion refinement data and the overlapped block motion compensation).

De Bonet does not specifically disclose the fractional bit plane of an associated enhancement layer reference frame. However, Wu teaches the use of the fractional bit plane of an associated enhancement layer reference frame (fig.9, Wu discloses the use of encoding at least the fractional bit plane of an associated enhancement layer reference frame in elements 226(1) to 226(n)). Therefore, it would have been obvious to one of ordinary skill in the art to combine Wu's teaching of progressive fine-granularity scalable encoding scheme with De Bonet's video encoding/decoding system for yield high encoding efficiency and good error recovery, especially during transmission over the Internet and wireless channels (Wu col.6, ln.66 to col.7, ln.2).

Regarding claim 8, De Bonet discloses a method of decoding video according to claim 7, further comprising the step of decoding the frame residuals with scalable decoding selected from the group consisting of DCT based decoding or wavelet based decoding (col.16, ln.52-55; clearly, DCT based decoding must be done for proper decoding since DCT based coding is used in the encoding stage, and frame residuals are decoded in elements 1112 and 1136 of fig.11A and element 1163 of fig.11B).

Regarding claim 9, De Bonet discloses a method of decoding video according to claim 8, further comprising the steps of:

generating enhancement layer frames from the frame residuals (fig.10 is a general description of the enhancement layer decoder, where fig.11A and 11B show the specifics of generating enhancement layer frames from I, P and B frame residuals); and

generating an enhanced video from the base layer frames and the enhancement layer frames (fig.2, note element 260 is the layered video decoder that generates an enhanced video from the utilization of the base layer decoder module 270 and the enhancement layer decoder module 280, where in col.17, ln.44-50, fig.11B, element 1184 is where the appending of the high resolution frames occur and preparation of the high resolution frames for viewing at element 1187 is sent to a display like element 290 of fig.2 or element 146 of fig.1).

Regarding claim 10, De Bonet discloses a method of decoding video according to claim 7, wherein the frame residuals include B frame residuals (fig.11B, note "Residual B-frames" is decoded in element 1163).

Regarding claim 11, De Bonet discloses a method of decoding video according to claim 10, wherein the frame residuals further include P frame residuals (fig.11A, note "Residual P-frames" is decoded in element 1136).

Regarding claim 12, De Bonet discloses a method of decoding video according to claim 7, wherein the frame residuals include P-frame residuals (fig.11A, note "Residual P-frames" is decoded in element 1136).

Regarding claim 13, De Bonet discloses a memory medium for coding video (col.5, ln.30-48; fig.1 is a computer system configuration, including system memory, harddrive, magnetic disk drive, optical disc drive, keyboard input, processor (CPU), to execute instructions, subroutines or software code for coding video, where fig.2, 220 is a layered video coder), the memory medium comprising:

code for encoding an uncoded video to generate extended base layer reference frames (fig.2, element 220 is the layered video encoder that utilizes a base layer module 224 and an enhancement layer module 228 to generate base layer reference frames), each of the extended base layer reference frames including a base layer reference frame and at least a portion of an associated enhancement layer reference frame (in fig.9, De Bonet discloses the "extended" or enhanced base layer reference frames include base layer frames, as inputted in element 905, and at least a portion of an associated enhancement layer reference frame, as inputted in element 925 where high-resolution motion vectors are the "portion of an associated enhancement layer reference frame" , and also, in col.13, ln.48-50, note base layer and high resolution motion vectors are used for prediction where the reference frames, I and P frames, are used to obtain B-frames, thus prediction requires reference frames); and

code for predicting frame residuals from the uncoded video and the extended base layer reference frames (fig.6, element 655 generates frame residuals from uncoded video and fig.9, element 945 is where the frame residuals are generated from the extended base layer reference frames).

De Bonet does not specifically disclose the fractional bit plane of an associated enhancement layer reference frame. However, Wu teaches the use of the fractional bit plane of an associated enhancement layer reference frame (fig.9, Wu discloses the use of encoding at least the fractional bit plane of an associated enhancement layer reference frame in elements 226(1) to 226(n)). Therefore, it would have been obvious to one of ordinary skill in the art to combine Wu's teaching of progressive fine-

granularity scalable encoding scheme with De Bonet's video encoding system for yield high encoding efficiency and good error recovery, especially during transmission over the Internet and wireless channels (Wu col.6, ln.66 to col.7, ln.2).

Regarding claim 14, De Bonet discloses a memory medium for coding video according to claim 13, further comprising code for scalable encoding the frame residuals (col.13, ln.30-37; DCT based scalable coding is applied to the frame residuals to generate enhancement layer frames, as seen in fig.9, the frame residuals are coded in element 955, and then, in element 960, enhancement layer frames are generated).

Regarding claim 16, De Bonet discloses a memory medium for coding video according to claim 13, wherein the frame residuals include B frame residuals (col.12, ln.41-44 and fig.6, element 655 calculates the B frame residuals).

Regarding claim 17, De Bonet discloses a memory medium for coding video according to claim 16, where in the frame residuals further include P frame residuals (col.12, ln.41-44 and fig.6, element 655 calculates the P frame residuals).

Regarding claim 18, De Bonet discloses a memory medium for coding video according to claim 13, wherein the frame residuals include P frame residuals (col.12, ln.41-44 and fig.6, element 655 calculates the P frame residuals).

Regarding claim 19, De Bonet discloses a memory medium for decoding a compressed video having a base layer stream and an enhancement layer stream (col.5, ln.30-48; fig.1 is a computer system configuration, including system memory, harddrive, magnetic disk drive, optical disc drive, keyboard input, processor (CPU), to

execute instructions, subroutines or software code for decoding compressed video, where fig.2, 260 is a layered video decoder having a base layer decoder module 270 and an enhancement layer decoder module 280), the memory medium comprising:

code for decoding the base layer and enhancement layer streams to generate extended base layer reference frames (fig.2, element 260 decodes the base layer, via element 270, and the enhancement layer, via element 280, to generate "extended" or enhanced base layer reference frames for viewing an enhanced video output), each of the extended base layer reference frames including a base layer reference frame and at least a portion of an associated enhancement layer reference frame (in fig.11A, module 1020, at element 1124, the base layer reference frame data is received, and at element 1133, the "at least a portion of an associated enhancement layer reference frame" or residual P-frames are received, as disclosed in col.17, lines 1-8, and then the base layer reference frame data and the "at least a portion of an associated enhancement layer reference frame" are summed together at element 1142 to form high resolution P-frames); and

code for predicting frame residuals from the extended base layer reference frames (col.17, ln.1-14, in fig.11A, frame residuals are decoded and predicted from the "extended" or enhanced base layer reference frames by utilization and application of the enhancement of the upsampled motion vectors using additional enhancement layer motion refinement data and the overlapped block motion compensation).

De Bonet does not specifically disclose the fractional bit plane of an associated enhancement layer reference frame. However, Wu teaches the use of the fractional bit

plane of an associated enhancement layer reference frame (fig.9, Wu discloses the use of encoding at least the fractional bit plane of an associated enhancement layer reference frame in elements 226(1) to 226(n)). Therefore, it would have been obvious to one of ordinary skill in the art to combine Wu's teaching of progressive fine-granularity scalable encoding scheme with De Bonet's video encoding/decoding system for yield high encoding efficiency and good error recovery, especially during transmission over the Internet and wireless channels (Wu col.6, ln.66 to col.7, ln.2).

Regarding claim 20, De Bonet discloses a memory medium for decoding a compressed video according to claim 19, further comprising code for scalable decoding the frame residuals, the code for scalable decoding selected from the group consisting of DCT based code or wavelet based code (col.16, ln.52-55; clearly, DCT based decoding must be done for proper decoding since DCT based coding is used in the encoding stage, and frame residuals are decoded in elements 1112 and 1136 of fig.11A and element 1163 of fig.11B).

Regarding claim 21, De Bonet discloses a memory medium for decoding a compressed video according to claim 20, further comprising:

code for generating enhancement layer frames from the frame residuals (fig.10 is a general description of the enhancement layer decoder, where fig.11A and 11B show the specifics of generating enhancement layer frames from I, P and B frame residuals); and

code for generating an enhanced video from the base layer frames and the enhancement layer frames (fig.2, note element 260 is the layered video decoder that

generates an enhanced video from the utilization of the base layer decoder module 270 and the enhancement layer decoder module 280, where in col.17, ln.44-50, fig.11B, element 1184 is where the appending of the high resolution frames occur and preparation of the high resolution frames for viewing at element 1187 is sent to a display like element 290 of fig.2 or element 146 of fig.1).

Regarding claim 22, De Bonet discloses a memory medium for decoding a compressed video according to claim 19, wherein the frame residuals include B frame residuals (fig.11B, note "Residual B-frames" is decoded in element 1163).

Regarding claim 23, De Bonet discloses a memory medium for decoding a compressed video according to claim 22, wherein the frame residuals further include P frame residuals (fig.11A, note "Residual P-frames" is decoded in element 1136).

Regarding claim 24, De Bonet discloses a memory medium for decoding a compressed video according to claim 19, wherein the frame residuals include P frame residuals (fig.11A, note "Residual P-frames" is decoded in element 1136).

Regarding claim 25, De Bonet discloses an apparatus for coding video (fig.2, element 220), the apparatus comprising:

means for encoding an uncoded video to generate extended base layer reference frames (fig.2, element 220 is the layered video encoder that utilizes a base layer module 224 and an enhancement layer module 228 to generate base layer reference frames), each of the extended base layer reference frames including a base layer reference frame and at least a portion of an associated enhancement layer reference frame (in fig.9, De Bonet discloses the "extended" or enhanced base layer

reference frames include base layer frames, as inputted in element 905, and at least a portion of an associated enhancement layer reference frame, as inputted in element 925 where high-resolution motion vectors are the "portion of an associated enhancement layer reference frame" , and also, in col.13, ln.48-50, note base layer and high resolution motion vectors are used for prediction where the reference frames, I and P frames, are used to obtain B-frames, thus prediction requires reference frames); and

means for predicting frame residuals from the uncoded video and the extended base layer reference frames (fig.6, element 655 generates frame residuals from uncoded video and fig.9, element 945 is where the frame residuals are generated from the extended base layer reference frames).

De Bonet does not specifically disclose the fractional bit plane of an associated enhancement layer reference frame. However, Wu teaches the use of the fractional bit plane of an associated enhancement layer reference frame (fig.9, Wu discloses the use of encoding at least the fractional bit plane of an associated enhancement layer reference frame in elements 226(1) to 226(n)). Therefore, it would have been obvious to one of ordinary skill in the art to combine Wu's teaching of progressive fine-granularity scalable encoding scheme with De Bonet's video encoding system for yield high encoding efficiency and good error recovery, especially during transmission over the Internet and wireless channels (Wu col.6, ln.66 to col.7, ln.2).

Regarding claim 26, De Bonet discloses an apparatus for coding video according to claim 25, further comprising means for scalable encoding the frame residuals

(col.13, ln.30-37; DCT based scalable coding is applied to the frame residuals to generate enhancement layer frames, as seen in fig.9, the frame residuals are coded in element 955, and then, in element 960, enhancement layer frames are generated).

Regarding claim 28, De Bonet discloses an apparatus for coding video according to claim 25, wherein the frame residuals include B frame residuals (col.12, ln.41-44 and fig.6, element 655 calculates the B frame residuals).

Regarding claim 29, De Bonet discloses an apparatus for coding video according to claim 28, wherein the frame residuals further include P frame residuals (col.12, ln.41-44 and fig.6, element 655 calculates the P frame residuals).

Regarding claim 30, De Bonet discloses an apparatus for coding video according to claim 25, wherein the frame residuals include P frame residuals (col.12, ln.41-44 and fig.6, element 655 calculates the P frame residuals).

Regarding claim 31, De Bonet discloses an apparatus for decoding a compressed video having a base layer stream and an enhancement layer stream (fig.2, element 260 is a layered video decoder having a base layer decoder module 270 and an enhancement layer decoder module 280), the apparatus comprising:

means for decoding the base layer and enhancement layer streams to generate extended base layer reference frames (fig.2, element 260 decodes the base layer, via element 270, and the enhancement layer, via element 280, to generate "extended" or enhanced base layer reference frames for viewing an enhanced video output), each of the extended base layer reference frames including a base layer reference frame and at least a portion of an associated enhancement layer reference frame (in fig.11A,

module 1020, at element 1124, the base layer reference frame data is received, and at element 1133, the "at least a portion of an associated enhancement layer reference frame" or residual P-frames are received, as disclosed in col.17, lines 1-8, and then the base layer reference frame data and the "at least a portion of an associated enhancement layer reference frame" are summed together at element 1142 to form high resolution P-frames); and

means for predicting frame residuals from the extended base layer reference frames (col.17, ln.1-14, in fig.11A, frame residuals are decoded and predicted from the "extended" or enhanced base layer reference frames by utilization and application of the enhancement of the upsampled motion vectors using additional enhancement layer motion refinement data and the overlapped block motion compensation).

De Bonet does not specifically disclose the fractional bit plane of an associated enhancement layer reference frame. However, Wu teaches the use of the fractional bit plane of an associated enhancement layer reference frame (fig.9, Wu discloses the use of encoding at least the fractional bit plane of an associated enhancement layer reference frame in elements 226(1) to 226(n)). Therefore, it would have been obvious to one of ordinary skill in the art to combine Wu's teaching of progressive fine-granularity scalable encoding scheme with De Bonet's video encoding/decoding system for yield high encoding efficiency and good error recovery, especially during transmission over the Internet and wireless channels (Wu col.6, ln.66 to col.7, ln.2).

Regarding claim 32, De Bonet discloses an apparatus for decoding a compressed video according to claim 31, further comprising scalable decoding means

for decoding the frame residuals, the scalable decoding means selected from the group consisting of DCT based decoding means or wavelet based decoding means (col.16, ln.52-55; clearly, DCT based decoding must be done for proper decoding since DCT based coding is used in the encoding stage, and frame residuals are decoded in elements 1112 and 1136 of fig.11A and element 1163 of fig.11B).

Regarding claim 33, De Bonet discloses an apparatus for decoding a compressed video according to claim 32, further comprising:

means for generating enhancement layer frames from the frame residuals (fig.10 is a general description of the enhancement layer decoder, where fig.11A and 11B show the specifics of generating enhancement layer frames from I, P and B frame residuals); and

means for generating an enhanced video from the base layer frames and the enhancement layer frames (fig.2, note element 260 is the layered video decoder that generates an enhanced video from the utilization of the base layer decoder module 270 and the enhancement layer decoder module 280, where in col.17, ln.44-50, fig.11B, element 1184 is where the appending of the high resolution frames occur and preparation of the high resolution frames for viewing at element 1187 is sent to a display like element 290 of fig.2 or element 146 of fig.1).

Regarding claim 34, De Bonet discloses an apparatus for decoding a compressed video according to claim 31, wherein the frame residuals include B frame residuals (fig.11B, note "Residual B-frames" is decoded in element 1163).

Regarding claim 35, De Bonet discloses an apparatus for decoding a compressed video according to claim 34, wherein the frame residuals further include P frame residuals (fig.11A, note "Residual P-frames" is decoded in element 1136).

Regarding claim 36, De Bonet discloses an apparatus for decoding a compressed video according to claim 31, wherein the frame residuals include P frame residuals (fig.11A, note "Residual P-frames" is decoded in element 1136).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen Wong whose telephone number is (571) 272-7341. The examiner can normally be reached on Mondays to Thursdays from 8am-6pm Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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